

CLAIMS

1. Method of rapid software application development for a wireless mobile device, comprising the step of calling modular software elements, that each (i) encapsulate functionality required by the wireless mobile device and (ii) share a standard interface structure and (iii) execute on the device, under the control of a command line interface.
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2. The method of Claim 1 in which one or more modular software elements encapsulate device networking functions.
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3. The method of Claim 2 in which the device networking functionality relates to connectivity over one or more of the following: GPRS, 2G cellular, CDMA, WCDMA, Bluetooth, 802.11, infra-red, IP networking, dial up, modem; HSCSD and EDGE.
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4. The method of Claim 1 in which one or more of the modular software elements encapsulate general mobile device functionality.
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5. The method of Claim 4 in which the general mobile device functionality relates to one or more of the following: call control and handling; PIM functionality; SIM functionality; remote control, including screen scraping and faking key presses; monitoring, including processes, threads, memory and settings; UI, including creating an application where the screen elements are specified from a script; telephony, including monitoring and making calls; file system, including reading writing files and folders, monitoring for changes; database, including structured storage, retrieval, searching and monitoring of arbitrary application data; device personalization, 25 including ringtones, wallpaper and settings.
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6. The method of Claim 1 in which the element under the control of a command line interface is a TCPIP interface which allows other programs on the device to be run upon receipt of an incoming connection or to make outgoing connections from the device under control of other device based programs.
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7. The method of Claim 1 in which the element under the control of a command line interface implements a remote command execution protocol.

8. The method of Claim 1 in which the element under the control of a command line interface implements a scripting language that allows scripts to be written which use other programs on the device also controlled by a command line interface.

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9. The method of Claim 1 in which a high level language program runs on an application development computer remote from the device that can send instructions to the or each element on the device controlled by a command line interface.

10. 10. The method of Claim 9 in which the high level language program is a command line program that enables IP connections between the mobile device and a further program on the application development computer that implements the same remote command execution protocol as the device.

15. 11. The method of Claim 10 in which rapid application development is achieved by enabling device capabilities to be explored by executing the device-based elements controlled by a command line interface from a command prompt of the application development computer using the remote command execution protocol.

20. 12. The method of Claim 11 in which an output of each command is shown at the command prompt on the application development computer.

25. 13. The method of Claim 10 in which rapid application development is achieved by using scripts which combine the results of several device-based elements controlled by a command line interface in the scripting language written on the device.

14. The method of Claim 13 in which the script is composed in a text editor running on the application development computer.

30. 15. The method of Claim 13 or 14 in which rapid application development is achieved by transferring the scripts to the device and executing them, again using the computer command prompt.

16. The method of Claim 1 in which the standard interface structure of a modular software element is the name of the element, a set of command line options, two input streams and two output streams.

5 17. The method of Claim 9 in which the high level language is not restricted to a single type of high level language, but can be any of the following depending on the requirements of the developer of the software application:

- 10 (a) a command line interface;
- (b) a scripting language;
- (c) a compiled language.

18. The method of Claim 17 in which the application development computer is a desktop PC.

15 19. The method of Claim 1 in which the high level language program can in addition run on the device, to enable re-programming of the device without the need to use a separate application development computer.

20 20. The method of Claim 1 in which the modular software elements insulate the application developer from the specifics of the operating system of the device by requiring the application developer to understand the type of functionality to be deployed and not the specific operating specific code needed to implement that functionality using the operating system.

25 21. The method of Claim 9 in which the device runs a command interpreter and the application development computer runs a command execution shell.

22. The method of Claim 9 in which the application development computer is connected to the device over a local point to point IR, Bluetooth, USB, WAN, LAN, 30 SMS or GPRS or any combination of these.

23. The method of Claim 1 in which modular software elements can be chained together to build complex functionality.

24. The method of any preceding Claim in which the modular software elements execute on the device in the context of an identity and associated permissions.
- 5 25. The method of Claim 24 in which there is an identity server with secure permissions that provides and controls the identity and associated permissions.
26. The method of Claim 25 in which the identity server is located on the device.
- 10 27. A software application developed using the method of any preceding Claim 1 – 26.
28. The software application of Claim 27 which is initiated or controlled from a remote application development computer.
- 15 29. The software application of Claim 28 which is accessed or controlled by the remote application development computer in a secure fashion.
30. The software application of Claim 27 which runs stand-alone on the device without any initiation or control from a remote application development computer.
- 20 31. Method of rapid software application development for a wireless mobile device, comprising the step of calling modular software elements, that each (i) encapsulate networking functionality required by the wireless mobile device and (ii) share a standard interface structure and (iii) execute on the device, using a high level language program.
- 25 32. The method of Claim 31 in which the high level language is
 - (a) a command line interface; or
 - (b) a scripting language; or
 - (c) a compiled language.
- 30 33. The method of Claim 31 or 32 further comprising the specific subject matter of any of preceding Claims 1 – 26.

34. The method of any preceding method claim in which the modular software elements execute on a CPU of the mobile device.